NOTES ON AUSTRALIAN THYNNINAE.

III. The Genus Thynnoides.

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(*Communicated by Dr. A. J. Nicholson.*)

(Eighty-eight Text-figures.)

[Read 26th November, 1958.]

Synopsis.

The definition of the genus is discussed. Keys to known males and females are given with the characters used figured. Two new species are described, and one male and two females are described for species previously known from the other sex only.

Introduction.

Although all known species of *Thynnoides* are dealt with in this paper the exact status of the genus is still not clear and it seems certain that it must ultimately encroach on other genera such as *Lophocheilus* and *Lestricothynnus*. Indeed, the entire generic classification of the subfamily requires revision.

The basis of this paper lies in figures and use of only diagnostic characters in descriptions. It is intended to guide more extensive work which is sure to follow.

Acknowledgement is made to the trustees and staff of the British Museum (Natural History) and the staff of the Hope Department of Entomology, Oxford University, for permission to examine and publish data on their collections and for assistance in many ways. To Mr. M. W. Mules, Mr. F. E. Wilson and Mr. J. C. Le Souef, of Melbourne, Dr. P. B. Carne and Mr. E. F. Riek, of C.S.I.R.O., Canberra, and to Mr. G. Stephens, of Hamilton, Victoria, acknowledgement is given for collecting specimens on request.

In particular, I am indebted to Mr. E. F. Riek and Dr. P. B. Carne for detailed criticism of the draft of this paper.

Genus Thynnoides Guérin, 1838.

Voy. Coquille, Zool. 2, (2): 214.—*Thynnidea* Ashmead, 1903, *Canad. Ent.*, 35: 98.—*Thynnus* (*Thynnus*) (part) Turner, 1908, Proc. Linn. Soc. N.S.W., 33: 198.

Genotype: *Thynnoides fulvipes* Guérin.

Male: Hypopygium strongly produced from lateral spines or shoulders to an apical spine, broadest at lateral spines or shoulders. Abdomen narrowly fusiform, segments strongly constricted at base, no spines on sixth ventral segment. Epipygium terminating in a thin, transparent margin or plate. Antennal segments not arcuate.

Female: Fifth abdominal segment ventrally rugose; pygidium narrow, longitudinally carinate or rugose; second abdominal segment with five or six strongly-raised transverse carinae. Head and thorax not coarsely punctured; anterior margin of pronotum bearing long hairs.

Remarks on the genus.—The genus is an ill-defined one, particularly as regards males. Confusion with *Lophocheilus* Guérin, *Lestricothynnus* Turner, *Zaspilothynnus* Ashmead (a few species only) and *Elidothynnus* Turner cannot readily be avoided. *Zaspilothynnus* may be separated in the male by the prominent, almost bulbous nature of the clypeus (Text-fig. D, 14), the depressed subapical area on the epipygium (Text-fig. D, 15), and the presence of ventro-lateral tubercles or spines on the sixth abdominal segment. *Zaspilothynnus* females have never less than seven transverse carinae on the second abdominal segment, a broad pygidium, usually striate fifth abdominal sternite and broad mesotibiae in most species (Text-fig. D, 16). *Elidothynnus* is in many ways

intermediate between *Zaspilothynnus* and *Thynnoides*, the males having the bulbous clypeus of the former but lacking tubercles or spines on the sixth sternite, and having genitalia which would place them in *Thynnoides*. They may usually be separated by the presence of yellow markings on thorax and abdomen, and lack of marked constriction between abdominal segments. Females are structurally similar to *Thynnoides*, but have radially or longitudinally arranged carinae on the fifth sternite as in most species of *Zaspilothynnus*. *Lestricothynnus* males are extremely difficult to separate from *Thynnoides*, particularly species which are black in colour. The males are more slender and genitalia appear to present differences, but no other distinctions have been noted. The females appear to show no better characters for separation from *Thynnoides* than do the males. Had all types concerned been seen by the writer, these two genera would probably have been combined in this paper, under *Thynnoides*. The genus *Lophocheilus* in some respects, particularly in one or two species, is intermediate between *Thynnoides* and *Zaspilothynnus*. The principal difference between *Thynnoides* and *Lophocheilus* lies in the broad pygidium and greater number of transverse carinae on the second abdominal segment of females of the latter genus. *Lophocheilus* males are generally larger and broader than are those of *Thynnoides*, but neither this nor the presence of tapering antennae in the former (Turner, 1910, p. 16) is reliable. It would seem probable that *Lophocheilus villosus* Guérin (Text-fig. D, 17), at least as interpreted by Turner, should be combined with *Thynnoides* and the majority of the remaining species combined with *Hemithynnus*.

Key to Thynnoides. (Text-figs. A, B.)

Males.

1. Lower margin of clypeus rounded (W.A.) ..... *preissii* Turn.
   Lower margin of clypeus truncate ..... 2.
2. Abdominal segments 4 and 5 ventrally subtuberculate (Text-fig. A, 9) ..... 3.
   Abdominal segments 4 and 5 not ventrally subtuberculate ..... 7.
3. Fore-coxae strongly produced posteriorly (Text-fig. A, 4) (S.A., Vic., N.S.W.) ..... *gracilis* (Westw.)
   Fore-coxae slightly if at all produced posteriorly (Text-fig. A, 3, 5) ..... 4.
4. Mesosternal intercoxal processes small, not completely covering coxal bases (Text-fig. A, 7) ..... 5.
   Mesosternal intercoxal processes completely covering coxal bases (Text-fig. A, 6) ..... 6.
5. Anterior pronotal margin not reflexed medially (Text-fig. A, 10), tegulae testaceous (Qu., N.S.W.) ..... *mesopleuralis* Turn.
   Anterior pronotal margin reflexed medially (Text-fig. A, 11), tegulae dark (S.A., Vic., N.S.W., A.C.T.) ..... *rufithorax* Turn.
6. Pronotum sparsely finely punctate, fore-trochanters not spinose (N.S.W., Vic., S.A., A.C.T.) ..... *pugionatus* Guér.
   Pronotum closely finely punctate, fore-trochanters spinose (Text-fig. A, 3), Australia ..... *bidens* (Sauss.).
7. First abdominal segment ventrally subtuberculate or sharply angled medially (Text-fig. A, 13) ..... 8.
   First abdominal segment not ventrally subtuberculate or sharply angled (Text-fig. A, 14) ..... 12.
8. Legs black or dark in colour ..... 9.
   Legs light in colour ..... 11.
9. Fore-coxae strongly concave ..... 10.
   Fore-coxae not strongly concave (Qu.) ..... *juscocostalis* Turn.
10. Clypeus mainly black (N.S.W.) ..... *waterhousei* (Turn.)
    Clypeus mainly yellow (Tas., Vic., N.S.W.) ..... *senilis* (Erichs.).
11. Tegulae testaceous (Vic., N.S.W.) ..... *fumipennis* (Westw.).
    Tegulae black (N.S.W., Vic.) ..... *fulvipes* Guér.
12. Abdomen marked with yellow (W.A.) ..... *lanio* Turn.
    Abdomen not marked with yellow ..... 13.
13. Fore-coxae convex (W.A.) ..... *berthoudi* Turn.
    Fore-coxae concave ..... 14.
14. Clypeus black, procoxal posterior process reflexed downward (Text-fig. A, 15) (Vic.) ..... *lugubris*, n. sp.
    Clypeus yellow or yellow margined, procoxal process not reflexed ..... 15.
15. Clypeus entirely yellow, wings dark (W.A.) ..... *mephelopterus* Turn.
    Clypeus narrowly yellow margined, wings almost completely clear (N.S.W.) ..... *wilsoni*, n.sp.

Females.

1. A mid-lateral tubercle on each side of head (Text-fig. A, 16) (Vic., S.A., N.S.W., A.C.T.) ..... *rufithorax* Turn.
   Head without mid-lateral tubercles ..... 2.
2. Propodeum acutely produced at anterior angles (Text-fig. A, 17) (W.A.) ..... *nephelopterus* Turn.
   Propodeum not produced at anterior angles ..... 3.
3. Anterior pronotal angles produced ..... 4.
   Anterior pronotal angles not produced ..... 6.
4. Anterior pronotal angles obtusely produced (Text-fig. A, 18) ..... *fulvipes* Guér., *moestus* (Smith), **fumipennis* (Westw.).
   Anterior pronotal angles acutely produced (Text-fig. A, 19) ..... 5.
5. Pygidium conspicuously laterally toothed (Text-fig. A, 20) (W.A.) ..... *lanio* Turn.
   Pygidium not conspicuously toothed (Text-fig. A, 21) (Vic.) ..... *lugubris*, n. sp.
6. Discal area behind antennae with numerous coarse punctures (Text-fig. A, 22) (Qu., N.S.W.) ..... *mesopleuralis* Turn.
   Discal area behind antennae almost impunctate ..... 7.
7. Head strongly elevated medially behind antennae (Text-fig. A, 23) (Tas., Vic., N.S.W.) ..... *senilis* (Erichs.).
   Head uniformly convex dorsally ..... 8.
8. Carinae on second abdominal segment strongly curved (Text-fig. B, 24) (S.A., Vic., N.S.W.) ..... *gracilis* (Westw.).
   Carinae on second abdominal segment not strongly curved (Text-fig. B, 25) ..... 9.
9. Head subcircular or broadest level with eyes (Text-fig. B, 26, 27) ..... 10.
   Head broadest posterior to eyes (Text-fig. B, 28) ..... 11.
10. Posterior margin of head bearing long hairs (Text-fig. B, 26) (N.S.W., Vic., S.A., A.C.T.) ..... *pugionatus* Guér.
    Posterior margin of head without hairs (Text-fig. B, 27) (W.A.) ..... *bidens* (Sauss.).
11. Apex of pygidium as in Text-fig. B, 29 (N.S.W.) ..... *waterhousei* (Turn.).
    Apex of pygidium as in Text-fig. B, 30 (Qu.) ..... *fuscocostalis* (Turn.).

* See remarks on *fumipennis* (Westw.).

THYNNOIDES PREISSII Turner, 1910.

Proc. zool. Soc. Lond., 1910, p. 284.

The male only is known.

The type in the Berlin Museum was taken in Western Australia.

Distinguished by the rounded clypeal margin, according to Turner.

Neither type nor determined material has been seen by the writer.

THYNNOIDES GRACILIS (Westwood), 1844. (Text-figs. A, 4, 9; B, 24, 31, 42; C, 1.)

Arcan. Ent., 2: 139. *Thynnus* (*Thynnoides*).—Turner, 1910, *Gen. Insect.*, 105: 46. *Thynnoides.—dallatorrei* Schulz, 1906, *Spolia Hym.*, p. 106. *Thynnus.*

The type pair in the Oxford University Museum is from Adelaide. Turner (1908) records the species also from Melbourne and from Mittagong, N.S.W.

Distinguished in the male by the prominent pronotal angles (as in *pugionatus*), the ventral abdominal tubercles (as in *mesopleuralis*, *rufithorax* and *pugionatus*) and the acute posterior angles of the fore-coxae.

Female distinguished by the strongly curved carinae on the second abdominal segment.

THYNNOIDES MESOPLEURALIS Turner, 1912. (Text-figs. A, 7, 10, 22; B, 34; C, 5.)

Ann. Mag. nat. Hist. (8), 10: 539.

Cotypes are in the British Museum, South Australian Museum, Western Australian Museum and the Queensland Museum. All were collected at Brisbane, Queensland, in September.

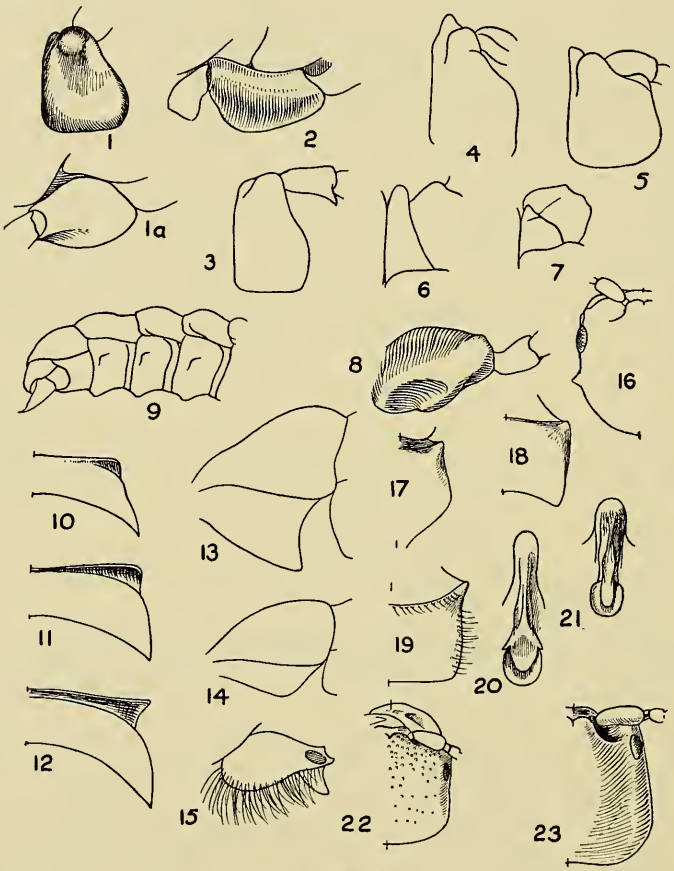
The key characters (small mesosternal intercoxal processes and lack of reflection of pronotal margin) adequately separate *mesopleuralis* males from other species. The reddish mesopleurae are not peculiar to the species.

For the female, the characters given in the key appear to be adequate.

A variant of this species, collected by P. B. Carne at Binalong, N.S.W., in October, 1950, is illustrated in Text-figs. B, 40, 44, and C, 15.

THYNNOIDES RUFITHORAX Turner, 1910. (Text-figs. A, 8, 11, 16; B, 36; C, 2.)
Proc. zool. Soc. Lond., 1910, p. 284.

The type female of this species is in the Berlin Museum and has not been seen by the writer. However, the characteristics of the species are so striking that there can be little doubt as to the identity of material examined. The type was taken at Ararat, Victoria. Material examined by the writer was collected at Cavendish, Wannon (near Hamilton) and Hamilton in Victoria, St. Ives and Burra in N.S.W., Canberra,



Text-fig. A.

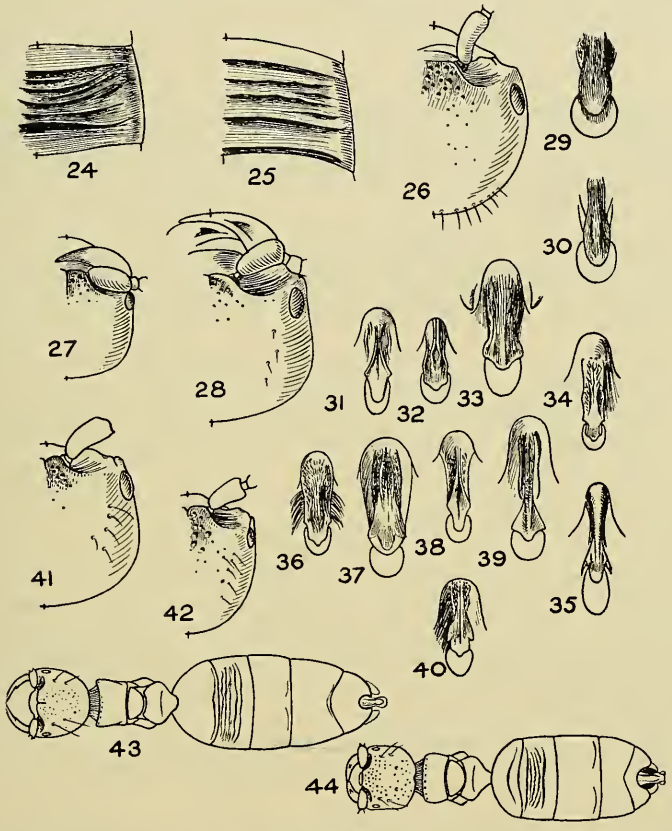
1, 1*a*: *T. fuscocostalis* male, fore-coxa, ventral, lateral. 2: *T. waterhousei* male, fore-coxa, lateral. 3: *T. bidens* male, fore-coxa, ventral. 4: *T. gracilis* male, fore-coxa, ventral. 5: *T. pugionatus* male, fore-coxa, ventral. 6: *T. pugionatus* male, mesosternal intercoxal process. 7: *T. mesopleuralis* male, mesosternal intercoxal process. 8: *T. rufithorax* male, metacoxa, ventral. 9: *T. gracilis* male, abdomen, ventrolateral. 10: *T. mesopleuralis* male, pronotum. 11: *T. rufithorax* male, pronotum. 12: *T. pugionatus* male, pronotum. 13: *T. fuscocostalis* male, first abdominal segment, lateral. 14: *T. berthoudi* male, first abdominal segment, lateral. 15: *T. lugubris* male, fore-coxa, lateral. 16: *T. rufithorax* female, head, dorsal. 17: *T. nephelopterus* female, propodeum, dorsal. 18: *T. fumipennis* female (type), pronotum, dorsal. 19: *T. lanio* female, pronotum, dorsal. 20: *T. lanio* female, pygidium. 21: *T. lugubris* female, pygidium. 22: *T. mesopleuralis* female, head, dorsal. 23: *T. senilis* female, head, dorsal.

and Mt. Gambier and Glencoe in South Australia. Although this is the dominant species on *Leptospermum* in the Hamilton district, western Victoria, during October and November, it is rarely met with elsewhere.

The female is adequately described by Turner and may at once be distinguished from all other species by the lateral tubercles on the head.

Male: Colour black except for yellow lateral clypeal margins, yellow mandible bases and leg colour which varies from black to ferruginous. Fore-coxae are flat or slightly concave; hind-coxae highly characteristic (Text-fig. A, 8). Third, fourth and fifth abdominal segments ventrolaterally tuberculate. Length (excluding antennae) 10–18·5 mm.

The specimens on which the above description of the male is based are in the collections of the Division of Entomology, C.S.I.R.O., Canberra, A.C.T., and the Entomology Division, D.S.I.R., Nelson, New Zealand.



Text-fig. B.

24: *T. gracilis* female, abdominal segment 2, dorsal. 25: *T. fuscocostalis* female, abdominal segment 2, dorsal. 26: *T. pugionatus* female, head, dorsal. 27: *T. bidens* female, head, dorsal. 28: *T. waterhousei* female, head, dorsal. 29: *T. waterhousei* female, pygidium. 30: *T. fuscocostalis* female, pygidium. 31: *T. gracilis* female, pygidium. 32: *T. bidens* female, pygidium. 33: *T. fumipennis* female (type), pygidium. 34: *T. mesopleuralis* female, pygidium. 35: *T. nephelopterus* female, pygidium. 36: *T. rufithorax* female, pygidium. 37: *T. fumipennis* female, pygidium. 38: *T. pugionatus* female, pygidium. 39: *T. senilis* female, pygidium (Daylesford). 40: *T. mesopleuralis* female, pygidium (Binalong, N.S.W.). 41: *T. fuscocostalis* female, head, dorsal. 42: *T. gracilis* female, head, dorsal. 43: *T. lugubris* female. 44: *T. mesopleuralis* female (Binalong, A.C.T.).

Thynnoides pugionatus Guérin, 1838. (Text-figs. A, 5, 6, 12; B, 26, 38; C, 6.)

Voy. Coquille, Zool. 2 (2), 234.

Type male in the Genoa Museum.

Turner's material is from Sydney, and other material examined by the writer was collected at Drik Drik, Victoria, Clare, S.A. (H. F. Lower), and Canberra, A.C.T. (P. B. Carne).

For determination of material, reliance had to be placed on Turner's identification of the British Museum material.

Turner states (1908, p. 249) that the male is almost identical with *gracilis*, having similar prominent anterior pronotal angles.

The red colour of the mesopleurae appears to occur in some specimens only, others being completely black. The fore-coxae (Text-fig. A, 4, 5) appear to give the best basis for specific separation of males of these two species. It is worthy of note that the second abdominal segment, as well as the third to fifth, is ventrally tuberculate in *pugionatus*.

The female is characterized by the head having a uniformly rounded posterior margin bearing prominent hairs (Text-fig. B, 26) and an almost impunctate disc. The abdomen is closely but unevenly punctate.

Variations.

A. Males vary in mesopleural colour. Specimens from Drik Drik and Nelson in Victoria and Bordertown in South Australia have the mesopleurae red, while in those from Canberra, Clare in South Australia, and Fernbank in Victoria they are black. Of two males from Cavendish in Victoria, one possessed black mesopleurae, the other red.

B. Fore-coxal posterior processes in some specimens are acutely pointed (as in Text-fig. A, 5); in others these are shorter and rounded. The acute form is the more general, but all material from Cavendish in Victoria and Bordertown in South Australia has the rounded form.

C. Female punctation. Specimens from Bordertown have coarser head punctation and more sparse abdominal punctation than other material.

D. Female colour. Specimens from Drik Drik, Nelson and Fernbank have the head and thorax red, those from Cavendish have only the thorax red, while other specimens are entirely piceous to black.

Note: Specimens of the various forms are deposited in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

THYNNOIDES BIDENS (Saussure), 1868. (Text-figs. A, 3; B, 27, 32; C, 3.)

Reise Novara, Zool. 2, Hym., p. 118. (♂) *Thynnus.*—Turner, 1910, *Gen. Insect.*, 105: 46. *Thynnoides.—viduus* Saussure, 1868, *Reise Novara*, Zool. 2, Hym., p. 123 (♀).

Turner (1908, p. 249) first placed this species with *viduus* under *T. gracilis* but in 1910 (p. 46) he altered his opinion to that stated above. The types have not been examined by the writer.

In the male, the acutely produced fore-trochanters (Text-fig. A, 3) are sufficiently characteristic for diagnosis, the distinctive hypopygium (Text-fig. C, 3) giving good supporting evidence.

The female is more difficult to determine with certainty, although the posteriorly broadly rounded head devoid of long hairs (Text-fig. B, 27) is fairly characteristic.

The type locality is Australia, and material determined by Turner is from south-eastern Australia.

THYNNOIDES FUSCOCOSTALIS Turner, 1912. (Text-figs. A, 1, 1*a*, 13; B, 25, 30, 41; C, 7.)

Ann. Mag. nat. Hist. (8), p. 540.

Cotypes are in the British Museum, South Australian Museum, and the Queensland Museum. The type locality is Brisbane, collected in September.

In the male, the ventrally sharply angled first abdominal segment (Text-fig. A, 13) groups the species with *waterhousei*, *senilis*, *fumipennis* and *fulvipes*, although in none of these is this character so strongly pronounced. The rounded margin of the fore-coxae (Text-fig. A, 1, 1*a*) separates the species from its nearest relative, *waterhousei* (Text-fig. A, 2), in which the coxae are strongly concave and ventrolaterally keeled. In *senilis* this keeling is evident but more rounded and less elongate in profile.

The females of *fuscocostalis* and *waterhousei* are very similar. The differences in the shape of the head (Text-fig. B, 28, 41) and pygidium (Text-fig. B, 29, 30) are the most obvious characters for separation.

THYNNOIDES WATERHOUSEI (Turner), 1908. (Text-figs. A, 2; B, 28, 29; C, 11.)

PROC. LINN. SOC. N.S.W., 33: 244. *Thynnus.*—1910, *Gen. Insect.*, 105: 46. *Thynnoides.*

The type pair in the British Museum was collected at Woodford, Blue Mountains, N.S.W.

This species is very similar to *fuscocostalis,* under which species characters for separation are discussed.

THYNNOIDES SENILIS (Erichson), 1842. (Text-figs. A, 23; B, 39; C, 12, 17–27; D, 1–13.)

Arch. Naturgesch. Berlin, 8: 263. *Thynnus.*—Turner, 1910, *Gen. Insect.*, 105: 46. *Thynnoides.*

This species is discussed on the basis of Turner's identification of British Museum material, the types not having been seen. Being an extremely variable species, final conclusions must be reserved pending careful examination of the type compared with the various forms in collections. The type is presumed to be in the Berlin Museum.

Confusion with *waterhousei*, *fumipennis* and *fulvipes* is likely. In what is taken to be the typical form, characters used in the key should be found satisfactory. However, even in particular localities, such as Adaminaby, N.S.W., the variation within what appears to be a single community is considerable. It is highly probable that with longer series available, several distinct species would emerge from what at present appears to be a heterogeneous assemblage of forms. These forms are considered below under locality headings.

A. Western Victoria.—The closest to British Museum material identified by Turner are pairs from Daylesford, Hamilton and Ararat. Even in these three pairs differences in female head shape (Text-fig. D, 1, 2) and the male fore-coxal process (Text-fig. C, 22, 27) are noted. In colour, females vary from piceous (Daylesford) to ferruginous (Ararat) on legs, head and pronotum. The pygidia of these females are as illustrated in Text-fig. B, 39.

Specimens from Dartmoor and Bochara (near Hamilton) are very similar to those already mentioned, but the pygidia of the females (Text-fig. D, 10) are less slender and the shape of the hypopygia (Text-fig. C, 17, 18) and the fore-coxal process (Text-fig. C, 22–24) of the males are different. However, all these western Victorian specimens could be considered to be conspecific.

B. Snowy Mountains and Monaro Plains area.—Pairs taken from Adaminaby, Jindabyne and Kiandra show marked variation from one another as well as certain common characteristics which would seem to separate them specifically from Victorian forms. The elongate fore-coxal processes (Text-fig. C, 25, 26) in the males, the head shape, lack of small internal teeth on the mandibles (Text-fig. D, 4–9) and the form of the apex of the pygidium (Text-fig. D, 11–14) in the females separate this group from group *A* above.

The Victorian specimens were collected during December and January, while those from N.S.W. were taken during February.

The female of *senilis* has not been described, and the specimens on which illustrations and remarks in this paper are based are in the collections of the Division of Entomology, C.S.I.R.O., Canberra, and the Entomology Division, D.S.I.R., Nelson, New Zealand.

THYNNOIDES FUMIPENNIS (Westwood), 1844. (Text-figs. A, 18; B, 33, 37; C, 8.)

Arcan. Ent., 2: 108. *Thynnus* (*Thynnoides*).—Turner, 1908, PROC. LINN. SOC. N.S.W., 33, 248. *Thynnus.*—1910, *Gen. Insect.*, 105: 46. *Thynnoides.*

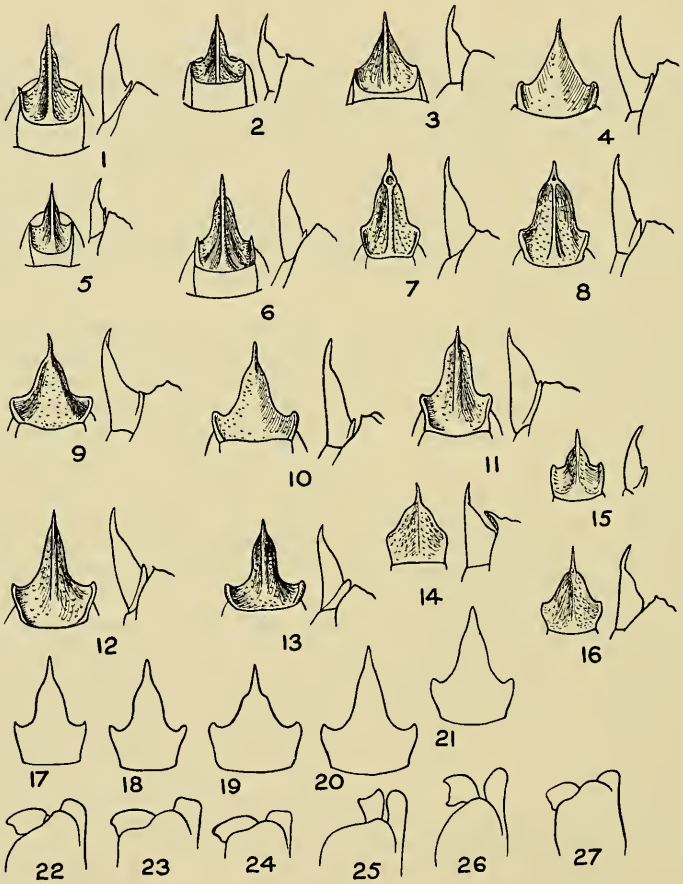
The types of the species are in the Oxford University Museum. Localities of material examined are Melbourne, Sydney, Croydon, Woori Yallock, Castlemaine, Cavendish and Nigretta.

The wings of the males are conspicuously ferruginous-fumed and the veins are ferruginous, not black as in *senilis.* Tegulae are light in colour. In the typical form, males have reddish legs, but specimens from western Victoria have the legs black.

Leg colour of females is as in the males, those from eastern Victoria being red, those from western Victoria black.

There is some confusion concerning the female of this and related species. The type female of *fumipennis*, the type of *moestus* (= *fulvipes*) and the British Museum series of *fulvipes* (16 females) appear to be identical. The series of *fumipennis* females in the British Museum are identical with those of the writer and not similar to the type. It therefore appears probable that Westwood's pair are not conspecific, his female belonging to *fulvipes*, not *fumipennis*.

The eleven pairs collected by the writer were all taken during December, localities being Woori Yallock, Croydon, Castlemaine, Cavendish and Nigretta.



Text-fig. C.

1-16: Hypopygium, ventral and lateral, of 1, *T. gracilis* male; 2, *T. rufithorax* male; 3, *T. bidens* male; 4, *T. berthoudi* male; 5, *T. mesopleuralis* male; 6, *T. pugionatus* male; 7, *T. fuscocostalis* male; 8, *T. fumipennis* male; 9, *T. lanio* male; 10, *T. nephelopterus* male; 11, *T. waterhousei* male; 12, *T. senilis* male; 13, *T. fulvipes* male; 14, *T. lugubris* male; 15, *T. mesopleuralis* male (Binalong, N.S.W.); 16, *T. wilsoni* male. 17-21: Hypopygium, ventral, of *T. senilis* male. 17, (Hamilton); 18, (Dartmoor, Bochara); 19, (Jindabyne); 20, (Adaminaby 1); 21, (Adaminaby 2). 22-27: Procoxal process of *T. senilis* male. 22, (Hamilton); 23, (Dartmoor); 24, (Bochara); 25, (Jindabyne); 26, Adaminaby); 27, (Daylesford).

THYNNOIDES FULVIPES Guérin, 1838. (Text-fig. C, 13.)

Voy. Coquille, Zool. 2 (2), p. 233 (♂).—? *rubripes* Guérin, 1838, *ibid.*, p. 233 (♂).—*labiatus* Klug, 1842, *Abh. Konigl. Akad. Wiss. Berlin*, 1840, p. 23 (♂).—*moestus* Smith, 1859, *Cat. Hym. B.M.*, 7: 36 (♀ not ♂).

The type male not having been seen, it is impossible to be certain of this species, which is closely allied to the variable species *fumipennis* and *senilis*. Confusion over females is mentioned under *fumipennis*.

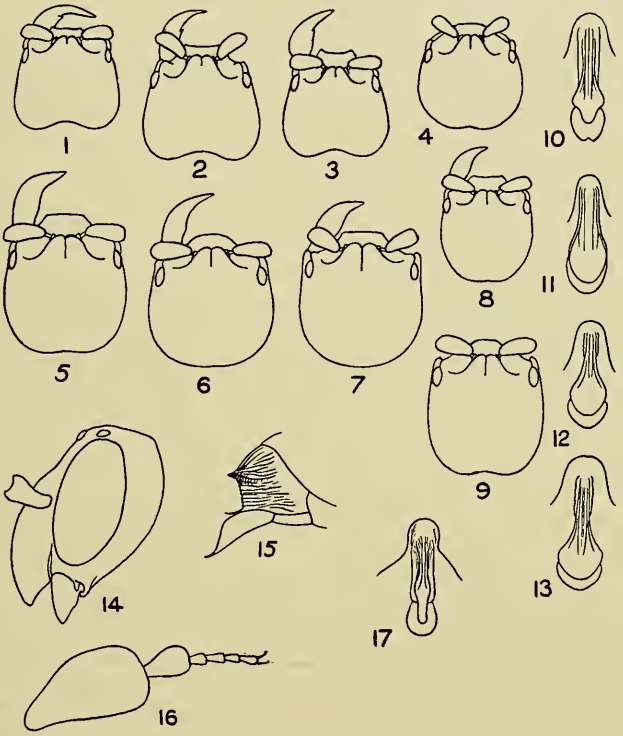
Turner states occurrence to be in Victoria and New South Wales.

THYNNOIDES LANIO Turner, 1910. (Text-figs. A, 19, 20; C, 9.)

Proc. zool. Soc. Lond., 1910, p. 286.

The type pair in the British Museum is from South Perth and was collected in February on *Eucalyptus* blossom.

Colour distinguishes the male, the species having the clypeus, inner margins of orbits, mandibles and antennal prominences yellow; yellowish lines laterally behind



Text-fig. D.

1-9: Head of *T. senilis* female. 1, (Daylesford); 2, (Hamilton, Ararat); 3, (Dartmoor, Bochara); 4, (Jindabyne); 5, (Kiandra); 6, (Adaminaby); 7, (Adaminaby 2); 8, (Adaminaby 1); 9, (Adaminaby). 10-13: Pygidium of *T. senilis* female. 10, (Dartmoor); 11, (Jindabyne); 12, (Adaminaby 2, etc.); 13, (Adaminaby 1). 14-15: *Zaspilothynnus hackeri* male. 14, head; 15, epipygium. 16: *Zaspilothynnus gilesi* female, mesotibia and tarsus. 17: *Lophocheilus villosus* female, pygidium.

the eyes, a transverse yellowish mark on the pronotum; the tegulae, a lateral patch on each side of abdominal segments 2–5 and a longitudinal mark on each side of the same segments, reddish-yellow.

The acute anterior pronotal angles (Text-fig. A, 19) distinguish the females of this species from others in Western Australia.

THYNNOIDES BERTHOUDI Turner, 1912. (Text-figs. A, 14; C, 4.)

Ann. Mag. nat. Hist., (8), 10: 540.

The type male was taken at Waroona, Western Australia, in December.

The male of this species, like the last, has distinctive colouring. The clypeus, mandibles, antennal prominences and a line around the head from the mandible bases

behind the eyes and ocelli yellow. Wings are moderately dark. The convex anterior coxae are also distinctive, although this is a character shared with *lanio* in Western Australia.

The yellow line behind the eyes and the convex coxae separate this species from *nephelopterus*, to which it is otherwise similar.

Female unknown.

THYNNOIDES LUGUBRIS, n. sp. (Text-figs. A, 15, 21; B, 43; C, 14.)

Male entirely black. Anterior pronotal angles not angular or prominent. Fore-coxae slightly concave, the posterior processes or angles very strongly reflexed downward (Text-fig. A, 15). Abdomen very finely punctate dorsally, the first segment flat ventrally, tubercles lacking on all segments. Hypopygium (Text-fig. C, 14) highly distinctive. Length (excluding antennae) 12–14·5 mm.

Female piceous or black, the legs and sometimes the head reddish. Mandibles very slender, each with a small inner tooth half-way between base and tip. Head strongly convex, laterally uniformly curved, very finely punctate, shining. Pronotum with anterior angles acute but not as prominent as in *lanio* (Text-fig. A, 19). Five long, uniform transverse carinae on the second abdominal segment, the fifth carina the highest. Abdominal puncturing fine and uniform.

Holotype male and allotype female in the collection of the Division of Entomology, C.S.I.R.O., Canberra. Paratypes in the collection of the Entomology Division, D.S.I.R., Nelson, New Zealand.

The type series (eleven pairs taken *in copula*) were all collected at Wannon (near Hamilton), western Victoria, on honey-sprayed foliage of *Eucalyptus* sp. during September and October, 1951. The number in this series is no indication of prevalence, since they were selected from many hundreds of thousands of pairs representing nearly forty species feeding at the sprayed tree over a number of seasons of observation and collection. It is probable that this species is relatively rare.

THYNNOIDES NEPHELOPTERUS Turner, 1910. (Text-figs. A, 17; B, 35; C, 10.)

Proc. zool. Soc. Lond., 1910, p. 284.

The types, which were collected at South Perth during December, are in the British Museum. This species is found on *Leptospermum* and sometimes *Eucalyptus* blossom, and is said to be plentiful.

The male may be distinguished by the solid yellow clypeus, which is very strongly convex, and the strongly concave procoxae. Apart from the yellow clypeus and mandible bases the male is black.

In the female, the acute propodeal angles (Text-fig. A, 17) are highly distinctive. The colour is dark reddish-brown, with the discal area of the second abdominal segment lighter.

THYNNOIDES WILSONI, n. sp. (Text-fig. C, 16.)

Male: Anterior clypeal margin and mandibles from base to towards apex, creamy yellow; margins of antennal prominences narrowly translucent cream-white; otherwise black. Anterior pronotal angles not produced, rounded. Fore-coxae strongly concave. Abdomen very finely punctate, not ventrally tuberculate. Transparent termination of epipygium very pronounced, hypopygial spine (Text-fig. C, 16) very slender.

The holotype male, collected by F. E. Wilson at Merimbula, N.S.W., in February, 1950, in the collection of the Division of Entomology, C.S.I.R.O., Canberra.

References.

TURNER, R. E., 1908.—A Revision of the Thynnidae of Australia. PROC. LINN. SOC. N.S.W., 33 (1) and (2): 70-256.

————, 1910.—*Gen. Insect.*, 105